

Claims

1. A method for deciding whether a mobile station used by a subscriber is allowed to camp in a cell of a mobile communications system comprising location areas, characterized by the method comprising the steps of:

defining exclusive location areas comprising exclusive cells;
receiving, via a cell, a request for location update which initiates a location update procedure for updating the subscriber's location to a new location area;

checking during the location update procedure whether the new location area is an exclusive location area; and

if the new location area is an exclusive location area:
- determining whether or not the subscriber is allowed to camp in the cell,

- allowing the mobile station to camp in the cell by accepting location update if the subscriber is allowed to camp in the cell, and
- preventing the mobile station from camping in the cell by rejecting the location update if the subscriber is not allowed to camp in the cell.

2. A method according to claim 1, characterized by the method further comprising the step of maintaining information about exclusive location areas in the network element rejecting or accepting location updates.

3. A method according to claim 2, characterized by the method further comprising the steps of:
maintaining information about location areas comprising exclusive cells by maintaining cell information indicating whether the cell is an exclusive cell; and

using cell information for deciding whether the location area is an exclusive location area.

4. A method according to claim 1, characterized by the method further comprising the steps of:

receiving an indication indicating whether the cell is an exclusive cell during location update; and

deciding on the basis of the indication whether the location area of the cell is an exclusive location area.

5. A method according to any of the preceding claims,
5 characterized by
the mobile communications system comprising local service areas;
the exclusive cells being exclusive access cells; and
the fact whether or not the subscriber is allowed to camp in the cell
is determined by comparing the local service area information of the cell to the
subscriber's local service area information .

6. A method according to claim 1, characterized by
the mobile communications system comprising local service areas;
the exclusive cells being exclusive access cells;
15 the fact whether or not the subscriber is allowed to camp in the cell
is determined by comparing the local service area information of the cell to the
subscriber's local service area information ; and
the method further comprising the steps of:
defining location service areas so that when an exclusive access
20 cell belongs to a location service area, the other cells in that location service
area are also exclusive cells;
maintaining information about location service areas comprising
exclusive cells; and
using that information for deciding whether the location area of the
25 cell is an exclusive location area.

7. A method according to claim 5 or 6, characterized by
receiving the location area identity of the cell, the local service area
information of the cell and the subscriber's identification information during the
30 location update.

8. A method according to claim 5, 6 or 7 characterized by
the method further comprising the steps of:
broadcasting the location area identity of the cell and the local
35 service area information of the cell;

broadcasting an indication indicating that the cell is an exclusive access cell on a broadcast channel when the cell is an exclusive access cell; when receiving the new location area identity and said indication in the broadcast in the mobile station:

- 5 - comparing the local service area information of the cell with the subscriber's local service area information stored in the mobile station; and
 -- if there is a match, camping in the cell by sending a location update request, or
 -- if there is no match, trying to find a suitable cell where to camp in
10 and if a suitable cell is not found, entering a limited service state.

9. A method according to any of the preceding claims
c h a r a c t e r i z e d by rejecting the location update with the cause "roaming not allowed in this location area"

15 10. A method for deciding whether to trigger a location update by a mobile station used by a subscriber c h a r a c t e r i z e d by the method comprising the steps of:

20 defining location areas so that all exclusive cells are in exclusive location areas comprising exclusive cells;

 broadcasting a location area identity and local service area information;

 broadcasting an indication indicating that the cell is an exclusive cell when the cell belongs to an location area comprising exclusive cells;

25 determining whether the mobile station is allowed to camp in the cell in response to receiving a new location area identity and the indication indicating an exclusive cell in the broadcast ; and

 if camping is allowed, sending a location update request, or

30 if camping is not allowed, trying to find a suitable cell where to camp and if a suitable cell is not found, entering a limited service state.

35 11. A method according to claim 10, c h a r a c t e r i z e d by the mobile communications system comprising local service areas; the exclusive cells being exclusive access cells; and the method further comprising the steps of:

broadcasting a location area identity and local service area information,

comparing the broadcast local service area information of the cell with the subscriber's local service area information in the mobile station in response to receiving a new location area identity and the indication indicating an exclusive access cell in the broadcast; and

if there is a match, sending a location update request, or

if there is no match, trying to find a suitable cell where to camp and if a suitable cell is not found, entering a limited service state.

12. A network comprising

exclusive cells (BTS) and other cells via which a mobile station may be connected to the network,

location areas defining groups of cells, and

at least one mobile station (MS) which is arranged, in response to a new location area, to send a location update request including the identity of the new location area and information about the subscriber using it,

characterized in that

at least one exclusive location area comprising an exclusive access cells is defined, and

the network (GSM) is arranged to access information about exclusive location areas and, in response to a location update of a mobile station, to check whether the location area in the location update is an exclusive location area and if it is, to check whether the subscriber is allowed to camp in the cell, and to reject the location update if the subscriber is not allowed to camp in the cell.

13. A network according to claim 12, characterized in that the network is arranged to broadcast the location area identity of

the cell and an indication that the cell is an exclusive cell when the cell belongs to an exclusive location area, and

the mobile station is arranged, in response to receiving a new location area identity and said indication, to determine whether the mobile station is allowed to camp in the cell, and if it is allowed, to send a location update request to the network, or if it is not allowed, to try to find a suitable

cell where to camp and if a suitable cell is not found, to enter a limited service state.

14. A network according to claim 12, characterized in that the network comprises local service areas defining local services for subscribers via cells or a cell defined as belonging to a local service area, and the network is further arranged to receive information on the local service area of the cell and to check whether the subscriber is allowed to camp in the cell by comparing the local service area information of the cell to the subscriber's local service area information.

15. A network according to claim 14, characterized in, that the network is arranged to broadcast the location area identity of the cell, the local service area information of the cell and an indication that the cell is an exclusive access cell when the cell is an exclusive access cell, and the mobile station is arranged, in response to receiving a new location area identity and said indication, to compare the broadcast local service area information of the cell with the subscriber's local service area information, and if there is a match, to send a location update request to the network, or if there is no match, to try to find a suitable cell where to camp and if a suitable cell is not found, to enter a limited service state.

16. A network element in a mobile communications system taking part in location update procedures between the system and a mobile station, which system comprises location areas, characterized in that the network element (MSC) is arranged to store or to have access to information about exclusive location areas comprising exclusive access cells and, in response to a location update to a cell, to check whether the location area to which the location update is targeted is an exclusive location area and if it is, to check whether the subscriber is allowed to camp in the cell, and to reject the location update if the subscriber is not allowed to camp in the cell.

17. A network element according to claim 16 in a mobile communications system comprising also local service areas defining local

services for subscribers via cells or a cell defined as belonging to a local service area, characterized in that the network element is further arranged to receive information on the local service area of the cell and to check whether the subscriber is allowed to camp in the cell by comparing the local service area information of the cell to the local service area information of the subscriber.

18. A network element according to claim 16 or 17, characterized in that the information about exclusive location areas comprise exclusive location areas having at least one cell which is in the area of the network element (MSC).

19. A mobile station which supports cell service definitions in a mobile communications system comprising location areas, and is arranged to receive broadcast information about a location area of the cell, characterized in that the mobile station (MS) is arranged to determine whether or not the subscriber is allowed to camp in the cell in response to receiving in the broadcast a new location area and an indication indicating that the cell belongs to a location area consisting of exclusive cells, and if it is allowed, to send a location update request to the network, or if it is not allowed, to try to find a suitable cell where to camp and if a suitable cell is not found, to enter a limited service state.

20. A mobile station according to claim 19 in a mobile communications system comprising also local service areas supporting local service area definitions, characterized in that the cell service definitions supported by the mobile station comprises local service area definitions, and the mobile station (MS) is arranged to receive broadcast information about local service areas of a cell and to perform the determining by comparing the local service area information of the cell with subscriber's local service area information in response to receiving in the broadcast a new location area and an indication indicating that the cell belongs to a location area consisting of exclusive access cells and if there is a match, to send a

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suitable cell where to camp and if a suitable cell is not found, to enter a limited
service state.~~

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